CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

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Lemaireocereus beneckii grown by Mr. Oliver Young, Bridgton, Maine. One-half size.

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GRAFTING

A Department conducted by Frank R. Mark, 825 Elyria Drive, Los Angeles. Mail him your problems.

Question: In making grafts should the cutting be dried before attempting to attach cutting to the stock, or should fresh cuts be used? Also, is there any advantage in using a wedge-shaped type of cut instead of a straight cut? A. J. M. G.

Answer: Both stock and scion should not only be freshly cut and in a growing condition but there should not be any unnecessary delay in joining the two parts together after the final cuts are made.

The flat type of graft seems to be the most popular as it is the easiest to make and is recommended for the amateur. The wedge or cleft graft provides a slightly larger area of contact on the same size plant but requires a great deal more care in fitting the two parts together.

On slender varieties such as Wilcoxias the side graft is very satisfactory, the diagonal cut giving the maximum area of contact by its elongated shape.

I regret to say that space in this column does not permit giving all the details of the technique of grafting, but we do welcome discussions of specific problems such as the above.

For those who contemplate taking up grafting this season I would heartily recommend securing a copy of *Cacti for the Amateur* which may be ordered from the JOURNAL. Thirteen pages are devoted to grafting with illustrations and detailed instructions for the beginner. FRANK R. MARK.

NEW LISTS

Wilhelm Triebner, Windhoek, So. West Africa. Special List No. 90 of Haworthias—plants and seeds. A valuable listing of these plants is shown in their new classification. Over 40 varieties and forms of *H. altilinea, cymbiformis, planifolia* and *Triebneriana* are listed.

Special List No. 92 is devoted to "Old and New Gasterias" and shows 70 species and varieties. Both lists free.

Approx. x 0.35

Kalandhoe tomentosa Bak.

By J. R. BROWN

As a result of the Humbert-Swingle Madagascar Expedition in 1928 many fine plants from that great Island have become available to horticulturists throughout the country. There would seem to be little doubt that *Kalanchoe tomentosa* is one of the finest of Dr. Swingle's introductions, as a well grown plant of it is a thing of great beauty.

The plant shown in the illustration was grown from one of the small plants of the first dissemination of Kalanchoes of this expedieion by the Bureau of Plant Industry, when it was distributed under the name of *Kalanchoe pilosa;* this was later corrected, but both names are still used and unfortunately probably always will be, as it seems that once a name gets into trade channels it goes on forever, regardless.

For a plant so tender looking, it is remarkably easy to grow, the usual potting soil would seem to suit it well as long as good drainage is provided. It grows continuously and ultimately when it reaches so large a size it flowers. The plant shown flowered the following season after the photo was taken and was about 60 cm. in height. The flowers were quite disappointing, the beauty of the plant lies entirely in the fine foliage, the leaves being densely covered with soft white hairs, giving them a beautiful silvery appearance. The crenations are marked with brown, shading from a light chestnut brown to a dark chocolate brown at the leaf tips where this marking is heaviest, this color contrast is very fine and striking. Where this plant is seen growing outdoors in Southern California the leaf color is

duller and greyish compared to the brilliant silvery color of indoor grown plants in good light.

Berger[1] in his grouping of the Kalanchoes places it in sect. I. *Stellatopilosae,* (stellate haired) the hairs being tripartite shortly above the base, this can be observed with a very good hand lens.

[1]Engler, Nat. Pflanzenfam. Bd. 18a (1930) 404.

REVIEWS

By DR. R. W. POINDEXTER

KAKTEENKUNDE for September, 1938

In the opening article Dr. Werdermann decides, after adequate discussion, that Britton and Rose's elevation of *Dolichothele* to the rank of an independent genus is not justified, and in his opinion it should be left as a subgenus of *Mammillaria* as it was originally set up by Schumann. To this is annexed his original description of a new species, *Mammillaria* (Dolichothele) *alyostera,* native in Mexico, a study of which was the motivation for the return of *Dolichothele* to the rank of a subgenus.

Illustrations of *Myrtillocactus geometrizans, Lobivia aurea,* and a plant which may be *Gymnocalycium mostii* appear with descriptive remarks.

The usual installment of the Cactus Growers' Encyclopedia is given, also an article by W. von Roeder on the care of cacti during bad weather. The number closes with an extensive review of recent books and literature and further seasonable notes on culture.

KAKTEENKUNDE for October, 1938

The opening article in the October issue is an original description of *Crassula johannis-winkleri* sp. n., followed by an illustrated article on the rare *Cotyledon buchholziana* by Dr. von Poellnitz. As a special feature the number contains an illustration of *Cleistocactus areolatus* in full color from a color photograph. There are also a black-and-white illustration of *Mammillaria* (Dolichothele) *aylostera,* a new species described by Werdermann in the preceding issue, and illustrations of *Opuntia microdasys, Mammillaria plumosa,* and *Rhinephyllum parvifolium.* An article by W. von Roeder deals with the forcing of flowers on cactus plants, a procedure which has much value to the commercial grower and, as Dr. von Roeder points out, can appreciably help to popularize cacti with the public who naturally are attracted by plants in full flower. This is a procedure which appears to have been largely overlooked in this country.

The number contains the usual regular features: namely, the current installment of the Cactus Growers' Encyclopedia, reviews of recent literature, and cultural notes.

KAKTEENKUNDE for November, 1938

This issue contains the following articles: A redescription of *Cereus horridus* and notes on its variety *alatosquamatus* from specimens in the Huntington Botanic Garden, on account of insufficient details in the original description; a list of cacti recommended to beginners in their first year; the current installment of the Cactus Growers' Encyclopedia; illustrations of five well known cactus species with brief notes; and seasonable notes on the care of cacti.

BEITRAGE zur SUKKULENTENKUNDE UND-PFLEGE 1938, II.

(Knowledge and Care of Succulents, 1938-2)

This issue carries so much important and valuable material that it is surprising it can be contained within its 32 pages. Of great interest are two reports on the first general meeting of the Central Research Bureau of the German Cactus Society, which was held in Essen June 16 and 17, 1938. During the meeting many addresses were given, some of them illustrated with slides. Moving pictures were exhibited by Curt Backeberg. There was also a very handsome exhibit of specimen plants and of herbarium sheets of cactus flowers. Besides this, there were social activities.

The work of the Central Research Bureau is divided into a number of activities which are carried on at various points. A collection of photographs is rapidly growing in Leipsig and already contains 3314 pictures covering 2166 species. This is under the direction of Dr. Dobe. An herbarium devoted to flowers is in charge of Herr Oehme. A type collection of seeds is in charge of Herr Krainz, president of the Swiss Cactus Society in Zurig. Dr. Buxbaum of Vienna is in charge of international correspondence and the coordination of the scientific institutions which are cooperating.

Also in this number are the following contributions: An article by O. Voll and C. Backeberg discusses the identity of certain *Discocactus* species and comes to the conclusion that *D. tricornis* is a distinct entity, as is also *D. alteolens,* whereas *D. heptacanthus* is very similar to *D. alteolens* and may be identical with it.

Hans Oehme illustrates the following plants in bloom: A plant previously described as *Echinocactus knuzii* which, by its flower, he definitely places in *Neoporteria* (Britton and Rose list this plant as of uncertain affiliation, probably belonging in Neoporteria); *Thelocactus subterraneus* originally described with "flower and fruit unknown" with a note that he is uncertain that it belongs in *Thelocactus* and reserves the right to reclassify it; and the plant previously known as *Echinocactus streptocaulon,* which he identifies as a *Copiapoa* and places in that genus as *Copiapoa streptocaulon.*

Bruno Georgi contributes an excellent illustration of *Echinopsis mirabilis* in flower with remarks, to which is appended a note by Doelz to the effect that Backeberg has erected the new genus *Setiechinopsis* to contain this species on account of its wide deviation from the ordinary habit of *Echinopsis.*

"The Psychological Moment in Cactus Culture" is by Dr. Schneider of Magdeburg and deals with soils and growing conditions.

"Memories of a Cactus Enthusiast" is an appreciation of the life and work of Johannes Nicholai.

An article on the care of the wood and glass of glasshouses recommends the preservation of wood by the Wolmanizing process, which is available in this country also and is now used to a considerable extent for the preservation of wood from dry rot and the attacks of termites.

An article on Rhipsalis culture by H. Rudolph with three illustrations is up to the usual high standard of this author. The article gives interesting glimpses of the particularly desirable species and detailed advice for their culture, the outstanding point of which is that they should be grown in soil rich in humus and with very moist conditions both as to air and soil.

The concluding article entitled "Shrubby Ice Plants for the Rock Garden" by H. Jacobsen, deals excellently with a group of plants which should receive more attention and contains three excellent illustrations and a good list of particularly recommended species.

WITH OUR AFFILIATES

A column conducted by Ervin Strong, 315 W. Esna, La Habra, Calif. Cactus and Succulent news is always welcome—use personalities but remember to connect their names with: how they grow it, where they found it, when they flowered it, how they built it, etc.

The Des Moines Cactus and Succulent Society, Inc., reports:

On behalf of the members of the Des Moines Cactus Society, I wish to advise you of the great pleasure we receive each time the mailman bring our copy of the CACTUS AND SUCCULENT JOURNAL. We have found invaluable material in each issue and our leaves are worn almost thin from the continual thumbing by the membership.

We are wondering if you have available copies of your glossary. It would be the most wonderful thing. We are attempting to learn the proper pronunciation of all terms and make a uniform key for all our members. In spite of the heavy snow, our group thinks of cacti and all are anxious to be getting their plants out into the gardens but we have several months yet to study up on the plants before we can leave them to nature's tricks in the yards and gardens. We are sponsoring a project in our city greenhouse. The Park Board is contemplating the purchase of several new greenhouses and if the deal goes through, we hope to install a desert garden on the order of the exhibition in Garfield Conservatory in Chicago. We are all saving our shoots and plan to donate many plants to our project and hope that maybe other cactus societies will donate a few plants to us. We will give them recognition and we believe it would be a rather clever idea having the public see how much interest there is in cacti, the country over.

Another interesting feature of our society is our experimental work. There is talk of the city installing soft water throughout the town and we are wondering what the chemical constituents in this water will do our cacti. Do you know? We try some plants outdoors as well as in and test the weather, climate, and topography of Iowa in respect to the culture of cacti. We lost one of our members last month. Mrs. Mary Findley passed away at the age of 93. We felt honored that a woman of that age was a cactus lover and took care of her collection up to several weeks before she died. MRS. GLEN G. WICKLIFF, *Pres.*

The Des Moines Society has sent in one of their papers which deals with the Opuntieae. From the Cactus and Succulent Society of Oklahoma we have received papers "A Beginner's Collection," "Three Distinctive Desert Plants" and "Questions and Answers." The Washington Society sent papers on "Greenhouse Construction," and "Growing Cactus From Seed." All of these papers contain excellent material for the JOURNAL and will be used from time to time.

Mrs. A. R. Lewis of the Washington group sends her experiences of last winter:

"My experiences last winter might be construed as suggestions of how NOT to winter cacti. We didn't get around to the heat situation for the greenhouse this winter so at the first sign of cold weather I placed a reflector-type electric heater in there and turned it on whenever a frost seemed eminent. I watched the temperature closely and found that with the temperature outside thirty or thirty-one degrees the best I could do with this heater was to bring it up to thirty-five or six inside. This would not be satisfactory if we should really have a nasty spell so I covered everything with several thicknesses of newspapers. This didn't work either—someone was always coming up to see the plants and I was forever covering and uncovering them. Finally we put a tent over the whole greenhouse—fastened it down securely all around and turned on the heater when cold was in the air. Now I found I could hold the temperature at almost forty degrees even if it went down to twenty-four or twenty-five degrees outside. I could do this by grouping the plants all together across the end and corner of the greenhouse and turning the heater under the bench so that it might circulate heat up behind the shelves. In that corner things would not freeze but at the other end icicles would hang down and all the glass be a sheet of ice. Then, too, I'm a long way from a weather prophet and I think I used the heater more nights it wasn't necessary than I did when it was necessary.

"Naturally with this tent fastened down and soaking wet most of the time ventilation was practically nil—also light—and on days when I was at home I ran in and out pushing the tent up to give them a ray of sun and pulling it down again when the rain came. And this, thank goodness, was a mild winter.

"Of course I lost some plants but with these conditions one could hardly expect to get by without losing some. Naturally they had to be plants I particularly admired—*Mammillaria geminispina*—a really lovely thing almost six inches tall, *Lemaireocereus grizeus* and *L. beneckei*—both of which were perfect specimens almost twelve inches tall. These two put me in deep mourning. In the same box with these was *L. pruinosus* and *C. peruvianus* (which could easily be replaced) neither one of which suffered at all. I'm wondering how I can replace *L. beneckei* and *grizeus* through the mail in good shape. Mine were so powdery and free from scar that I'm afraid I'm spoiled.

"I didn't water anything from October until about two weeks ago. Apparently there was sufficient humidity in the air for they all stood the abuse and are already plumping up now that they have had a few sunny days and a little water.

"And now I'm all set to make what may turn out to be a foolish move. I've filled my shelves with my soil mixture (you know—the same old stuff)—made hills of brick clinkers and valleys and I'm going to plant everything directly into this soil to make as nearly a desert scene as possible. So far I have practically no pests and I'm hoping that if I'm careful maybe I won't have any. By the way, I've done all my California shopping through Hummel's and have never received a bug." ADELE R. LEWIS.

FOR SALE

Rare seed pods of cactus in a variety of colors.
Guaranteed to trap mice!!!

"I am saving some seed from my Mams. but have a couple of mice that I can't trap who run away with the nice red and pink pods. I set a trap with one pod and it did the trick and I caught one mouse after cheese had failed. This must be a new one to bait a mouse trap with a cactus seed pod." PHIL OLSON, Wis.

FROM OHIO

Have purchased plants from Hummel's Exotic Gardens, service was prompt and courteous. Plants were shipped thousands of miles, in mid winter, arrived in the best of condition greatly exceeding my expectations. All are healthy and at present showing new growth. I heartily endorse the slogan "Patronize Journal advertisters to avoid disappointment."

FRED KOSTALEK.

They pointed out the "road" to us that we were to follow and much to my wife's disgust we started out through the brush. The road narrowed down until the bushes touched at the tops and we spread them apart with the bumper of the car. We soon came to a small stream. We crossed it at least 20 times. Sometimes the road was the middle of a dry stream bed, and again it was a cow path through the bushes but we pushed on for 18 or 20 miles until we reached the ocean. It was a beautiful sight at this point; at the mouth of a small river was a pond of warm water and we went swimming, also took a dip in the surf, but it was too cold, (Kelly only got one foot wet).

We spread our lunch near an adobe hut and had our first good meal in the open, after which Kelly and I started out to inspect the cacti which were growing in profusion everywhere. We found Mammillarias (*dioica* perhaps) growing so close together that it was hard to walk without stepping on them, some clumps had dozens of heads. Then there was *Echinocereus maritimus* —hundreds of beautiful clumps. Most of them were in bloom and we found clumps up to 4 or 5 feet across. I enclose a picture of a typical specimen and you can count the heads. My jackknife will give you an idea of the size of the heads. The spines were very long on some plants, too. We also found *Ferocactus viridescens* growing here, many small plants and a few 12 or more inches tall. Then we ran onto a large clump of *Machaerocereus gummosus* and we looked it over for fruit, for Kelly's seed bag. There was no fruit but I had my greatest thrill of the trip when I found a pretty crest.

It was windy by the sea, so we decided to go back up into the canyon to camp for the night, and we found a pleasant camp grounds about 5 miles up the canyon under a giant sycamore tree. We built a camp fire near the dry creek bed and after another snack of beans we made a bed of dry grass and spread our blankets on it. The girls were startled a bit by a jackass but a few sticks caused him to find a new home. About 2 a. m. we were awakened by a party of Mexicans in a passing car. We thought of bandits and every thing else for a minute, but we found that it was only a native family coming home from Ensenada and they wanted to be friendly. They gave us a drink from their bottle of 'Vino' and went on their way.

With the exception of getting stuck in the creek a couple of times our return trip to the main road was uneventful. On our return trip to Ensenada we stopped for a look at the *Myrtillocactus cochal* in San Carlos Canyon about ½ mile off the road. This was a wonderful sight to me for I had never seen *cochal* growing in wilds before. It was covered with tiny white flowers, very fragrant, and small red berries. Kelly asked us to help him collect the ripe fruit for seed but after I tasted it I ate more than I collected. It was here that we saw *M. gummosus* in flower and what a gorgeous flower—long stems and bright pink and white petals. We collected much fruit of *gummosus* for Kelly while he climbed to the top of the mountain to see if there were any cacti on the other side, but he saw none.

We returned home, tired but happy in the thought that we had seen a little of the *real Mexico*.

CARL F. BRASSFIELD.

ANSWERS TO QUERIES

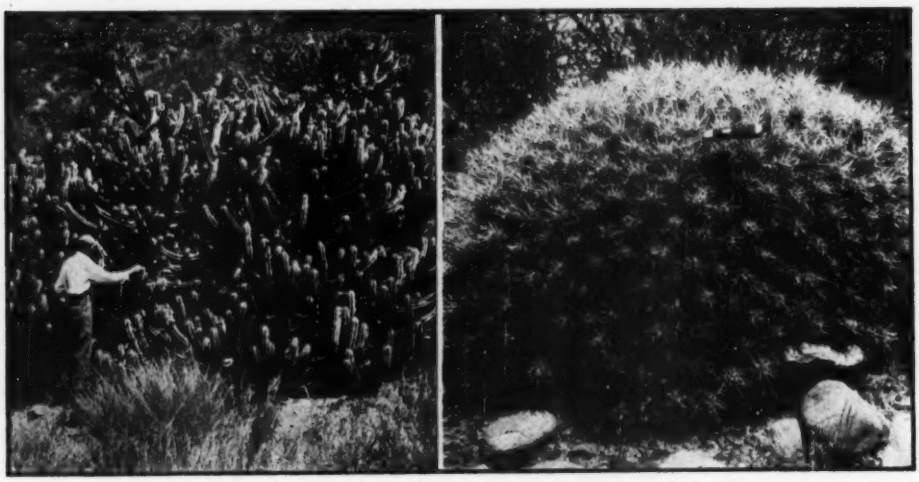
In one editorial I see the correct spelling of the common name of Carnegiea gigantea requested. In this connection I can only suggest that persons interested in succulents be also interested in Spanish—the two are inseparable. Sahuaro, saguaro and sajuaro in Spanish can all be rendered sawhäro in English with comparative accuracy. In asking natives of Arizona, however, I found sajuaro to be preferred by a majority of those asked.

In a note on mutations I would like to state that I produced variegation in *Echinopsis multiplex* by plunging it from around 50 degrees F. to 2 degrees F. and leaving it for 48 hours. The edges of the flutes froze and in four or five months the frozen places became white. Those badly frozen remained white in succeeding growth, but others only where frozen. Termites stopped the experiment by consuming the entire heart of the plant. Date seeds frozen in subzero weather in packed snow grew white date seedlings.

In classification of plants I suggest that as soon as possible a move be put under way to stop naming plants either specifically or generically after persons even though those persons be famous, responsible for the discovery of them or sentimentally connected to the discoverer unless they be the actual producer of a plant by hybridization. Most plants were here before any people and such names are not nearly as good as those which describe the plant. Native and place names are good, I believe, or those derived from some service the plant may render. For instance I would name *Ferocactus wislizeni, Ferocactus bisnaga* or *tequila* or some descriptive name or perhaps from its usefulness in making cactus candy. This is not intended to offend anyone and is merely a suggestion and I would appreciate comments.

Incidentally *Bisnaga* and *visnaga* are asked about. One should remember that to us English speaking people the Spanish pronunciation of "b" and "v" sound alike and are nearly like "b". Therefore, bisñaga is preferred by us. CARL O. HORST, Columbus, Ohio.

A swell job is your *Cacti for the Amateur*. Understandable and clear cuts, very instructive, etc. Wish you the best of luck with it. I have been buying plants from most of the dealers. They are a fine lot. I am the only one in this section of Florida that is trying to stimulate the cactus fever and I am having a job to get them started. I deal only in cacti and succulents. They are enough to enjoy. *H. W. Aitken, Florida.*



Myrtillocactus cochal and *Echinocereus maritimus* in Lower California

Lower California, Mexico

Our trip to Lower California on last Labor Day was a disappointment in one way because the "ten cars" of folks which President Marshall promised would meet us at Ensenada failed to come, with the exception of the Kellys, and if the other nine cars of folks had only known what a swell time the Kellys and Brassfields had they would surely have come.

Our trip to Ensenada was uneventful but delightful; the road to San Diego is very fast and smooth, four lanes most of the way through Long Beach, Balboa and Laguna. When we arrived at San Diego we took the ferry to Coronado and then down the "Silver Strand" to Tijuana at the Mexican border. We were admitted without permit by the Mexican custom officers as it was a holiday. Tijuana was all decorated in gay colors and there was much merrymaking by the crowds on the streets but we didn't stop as it was getting late and we still had 68 miles before we were to rest. The road from the border to Ensenada is paved but not like our roads since it had planty of chuck holes that the road builders plan to fix tomorrow but the scenery is so beautiful that one soon forgets the road.

We came in sight of the ocean after about 10 miles of hilly country and from this point on south we are never out of sight of cacti. At first it is *Bergerocactus emoryii,* that sticky yellow plant that looks more like a cylindrical Opuntia. In some places the hills are covered with it, and it gives them a yellow-golden color. Then comes the beautiful *Agave shawii* that grows on both sides of the road, right down to the sea and part way up on the hills. It is a lovely dark green and is so prolific that the rabbits must have to jump high to get through it. It was just starting to bloom, but did not make good pictures at this time.

Another beauty spot farther on was a mountain covered with white *Dudleya brittoni* Johansen. These plants are large and some are a foot across. There are thousands of them on a hill which is black, or dark brown rock, and the contrast makes a beautiful picture.

We arived at Ensenada about 8 p. m. and found Kelly, who had arrived earlier and had spent the afternoon looking for "Cactus Nuts."

After a fine breakfast in a Chinese restaurant we started out to see the town and perhaps to find some more people from L. A. In a small souvenir shop we talked to a Mexican boy who told us of a canyon road that led to the beach through the mountains and we were just foolish enough to try it.

We traveled over a none too good dirt road for about 30 miles to Santa Tomas, not a town but a store about 15 feet square. It was closed but we looked like customers so the "town" opened up for us. We had a drink of beer which was cooled with wet sacks, and we chatted with the natives in our poor Spanish, (Kelly knows half a dozen words).

Juvenile or seedling of *Ferocactus covillei*

Photographing Plants

By O. P. YOUNG, *Maine*

Under date of October 31, 1938, you expressed the opinion that readers of the *Journal* would like to know how I made the pictures of my plants which I sent you and of which you made such kind comment.

I've been playing around with photography ever since I was old enough to handle a camera. During the World War I was assigned to the Photographic Div. of the Air-Service and was stationed at Kodak Park, Rochester, N. Y.

My present camera is a 2¼x3¼ Voigtländer Avus, film pack or cut film, double extension, with f:4.5 anastigmat lens. I also use filters red, green, or yellow.

The film I use is the new Eastman Super XX Panchromatic or Panatomic if the negatives are to be greatly enlarged. All my developing and enlarging is done in our kitchen, which at night I convert into a dark room.

I don't believe that good cactus pictures can be made with a camera of much smaller film size than 2¼x3¼. A focusing back or groundglass is quite necessary as is double extension. Some of my negatives were made with the lens within six inches of the plant. This makes using a small lens-stop a necessity to get sharp detail all over the negative or depth of focus. A tripod must be used as exposures are relatively long. Use a good exposure meter, as the human eye is not a very accurate judge of light values.

Part of my pictures are made by daylight and part by Mazda light in reflector indoors at night.

Modeling is brought out by careful lighting and arrangements of reflectors and background.

Relative color values are retained by the use of eight filters. Any color filter will render its own color in a lighter tone on your print than would be the case were it not used. For example, if you wish to bring out detail in a yellow flower, use a yellow filter; if red or pink use a light red filter. To photograph a plant not in bloom, I usually employ a light green filter. Any of the modern Pan or Plenachrome films are sensitive to all colors without filters, but best results will be obtained by using them.

I am still working to improve my pictures.

As my collection of cacti and succulents is not large, I felt as though any reports I could send you would perhaps not be of sufficient interest, but your request in the last *Journal* has prompted me to submit a report of my results here in southwestern Maine.

My real interest in cacti was awakened about a year and a half ago, by a subscription to the *Cactus and Succulent Journal*. I purchased various seedlings and plants from Gates, Hummel and Johnson and began a tour of the various greenhouses in this section.

I bought all available books on cacti (except B. & R.) and also purchased a new camera with double extension so I make photographic records of my plants.

Cacti are a most intriguing class of plants from the artistic angle. Their forms, spine colors and formation, woolly areoles with vari-colored spines, have prompted me to make a large number of negatives of various plants when not in flower.

Plants which have flowered this season (ending in Sept.): *Mammillaria bocasana, M. camptotricha* (new buds forming), *M. viviflora* (buds forming), *Echinocactus horizonthalonius, Rebutia miniscula, Parodia aureispina, Echinocereus blanckii, E. dasyacanthus, Astrophytum myriostigma, Lophophora williamsii* (still in bloom), *M. viridiflora* (buds forming), *Phellosperma tetrancistra* (still in bloom).

Phellosperma tetrancistra (a graft from Howard E. Gates) has been in bloom continuously since the second week in July and now bears four buds. *M. bocasana,* I believe, was the first to flower (May) and has now six long scarlet pods. *Parodia aureispina* flowered next with golden blooms almost the same diameter as the plant. This has also been the best grower, as the scar where the last bloom fell off was near the center of the plant, but is now over an inch and a half from the center.

M. camptotricha had flowers lasting only a short time. It apparently was more concerned with raising a family of off-sets—nine in number. I was much surprised to find new buds on it this morning. The blooms on the Echinocerei were very large and lasted well over two days. Those on *Phellosperma tetrancistra* open only during the hottest part of the day and will close if the pot is moved into the shade, as I discovered while I was making a picture of them.

CULTURE

All my plants are in pots and are in a frame with a glass cover which is always wide open unless it rains. I follow Dr. Houghton's book as to soil requirements. The pots are plunged half-way in a mixture of sand and rich loam. Needed shade is supplied by a lath screen. I water when the soil under and around the pots becomes quite dry, which is usually every day.

I wish more of my plants had flowered, but I feel rather pleased with results so far this season. I have picked up at greenhouses various cactus plants and seedlings. They were not labelled and the florists were all about as familiar with cacti as I am with Chinese.

It seems to me that there is needed in cactus literature a photographic record of every known plant showing flowers, detailed spine and areole formation and growing center, together with color description of flower, plant body and spines.

Why couldn't each grower of these gems of plant life, who has a good focussing camera, cooperate in making such a book? Bound copies could be loaned to societies and responsible growers so that all of us who are really interested might check up on our plants. Original photos could be used to save cost of making printing cuts.

Probably if I were not an amateur photographer such an idea would not occur to me. Such a book I believe is certainly needed and I would be only too glad to do my part with my own collection and with any that were within reasonable distance.

I have several good succulents in my collection, *Echeveria*: *crispa, leucotricha, orpeti, pulvinata, harmsi* and *peacocki. Pachyphytum brevifolium, Kalanchoes*: *foedtshenkoi, marmorata* and *welwitschi* all flowered in the house last spring.

Am trying my hand at growing a few seedlings this winter. At present I have seedlings around one-fourth to one-half inch high of *Espostoa lanata, Haageocereus chosicensis, Oreocereus fossulatus, Ferocactus almosanus, F. fordii, F. echidne* and *Agave victoria reginae.* All these were germinated in December under an inverted aluminum bowl placed over the flat. In the top of the bowl was a 30-watt lamp. Germination was rather rapid. The Agave seeds came up first, followed closely by the Ferocacti. Espostoas and Haageocereus were next, the Mammillarias last of all.

Several of my specimen plants began a fall growth, so placed them near the glass when they were brought inside and this winter have watered carefully. Temperatures are between 65 degrees at night to up around 80 degrees when the sun shines in. The plants get sunlight from 10 a. m. up to 4 p. m. on a southwest exposure.

I realize this is entirely contrary to all rules of cacti culture, but the experiences of several of the *Journal* correspondents in regard to keeping plants growing without a resting period led me to experiment with those plants that started new growth late in the fall. Last winter (1937-38) I watered only from below about every week or ten days and only on bright days.

The plants now showing growth are *Cephalocereus senilis, Pyrrhocactus horridus, Chilenia subgibbosa, Neoporteria reichi, Notocactus leninghausii* and Mams: *habniana, bocasana, schmolli,* and *viviflora.*

You should well be proud of your book *Cacti for the Amateur.* It's the best thing I've found yet. I still can't figure how you can publish such a book at the price. Put me down for a copy of the book on succulents just as soon as published. If *Cacti for the Amateur* doesn't put a lot of new members in our Society I would be greatly disappointed. I only wish I could do more to help.

On a recent visit to a greenhouse in South Portland, Maine, I came across a beautiful specimen of *Aloe variegata* in bloom. The plant body was fully 14 inches in height of rich dark blue green; the individual segments being 2½ inches wide at the base and 6 to 8 inches long. The silvery markings on them were beautiful. Flower spike extended fully two feet above

rosette with seven buds open. Needless to say, the plant was not for sale.

OCTOBER

I have already moved my plants indoors for the winter. Most of them occupy sunny windows, while the others are gradually hardened off and kept in an unheated room, but where they will not chill.

With careful watering, those plants in the living-room windows with a southwest exposure, will most all grow easily right through the winter, as I discovered to my surprise last year, for I had read that cacti should *never* be watered during the colder months.

I do not of course give water as freely or as often as in summer. On bright clear days, the pots are set in pans and allowed to remain until the top-soil shows dampness.

I haven't as yet had a single case of etiolation in either Cerei or globular forms. Either I have an unusual case of knowing just what a cactus needs and when or I'm just plain lucky. I don't know.

I know of a plant of *Lemaireocereus beneckii* at a greenhouse that has been so pulled out by excess heat and moisture that it has lost all symmetry and beauty. My plant of the same was a three-inch seedling a year ago. It is growing on its own roots, was watered once a week all last winter.

I'm enclosing a photograph of it, made the other night by Photoflood (see front cover); it is growing in a mixture of loam from a hen-yard, sand and crushed sections of cement walk.

INFORMATION WANTED

There has been reported that an excellent display of cacti was shown at the Rutland Fair in Vermont. We are anxious to know the name of the exhibitor.

O. P. Y., *Maine.*

MADISON COOPER'S GARDENING MAGAZINE

Calcium, N. Y. $1.00 per year

The following articles which apepared in this Gardening Magazine show the nation-wide interest:

Illustration of Epiphyllum latifrons from Wisconsin.

P. M. Barnes of Iowa reported that he waited seven years for a Rat-Tail Cactus to flower but it was worth the wait.

Illustration of *Echinocereus enneacanthus* (Strawberry Cactus) from Texas.

Feature on Interesting Sempervivums being grown in Ohio.

You Can Grow Stapelias—also from Wisconsin.

Cactus Thrive Indoors—a report from Illinois.

The Interesting Ocotillo—from Arizona.

An uncredited photo of a huge *Pachycereus marginatus* in the Huntington Botanical Gardens and a delightful poem—.

THE FLOWER GROWER

Albany, N. Y. $2 per year

This magazine obtains more new memberships for the CACTUS JOURNAL than any other source. Recently an article in its pages "Fascinating Cacti" by E. R. Abbe made hundreds of contacts. Throughout the year there are many fine articles on succulents and hardly one of their question pages that does not contain a cactus question.

One of their subscribers asked why they did not have colored illustrations in their magazine like seed catalogues and this is their answer:

"Oh, yes, surely we would like to have color illustrations, too, only the fact of the matter is that they are just too expensive for us to consider. The seed catalog earns money from its color illustrations because people buy the seeds pictured. The only way in which the magazine can afford such things is when it has a sufficiently large circulation so that it can get very high prices for its advertising. With our present circulation running somewhere between sixty and seventy thousand, the rates that will be paid for advertising space does not leave sufficient margin to indulge in what, under the circumstances, would be extravagancies of color plates. Each plate would cost at least a thousand dollars."

—And all your Editor of the JOURNAL asks is for a membership of 2000 which would allow color plates in the JOURNAL!

SUCCULENTS BY JACOBSEN—1935

We have secured a few copies of this book at the $6.50 publication price. Will not again be available at this price. Box 101, Pasadena.

PENNSYLVANIA PROBLEMS

Until this year my cacti have always had to take nature's "pot luck." This past spring I managed to make a small house for them. "Small" is the word—just seven feet long and four feet wide. For the sake of ease of handling I used a glass substitute which is reputed to admit the ultra violet rays. Placing the shade lovers in one half and the sun lovers in the other I am able to grant to each group its wishes. The house was made for the plants hence I work from the outside through a drop door in the back and a hinged roof.

At once the house presented problems. First of all some ant visitors decided to locate permanently and, bringing their bugs with them and proceeding to plant them on the roots of the plants, caused me no end of concern. Having exterminated these, the cacti themselves became a problem due to astounding growth. Some seedlings doubled their size; some grew as much this year as they had in the past three years. One columnar seedling Cereus which was one foot tall at three years of age is now almost three feet tall at four years of age. Opuntias had to be pruned to keep them within bounds. *Hylocereus triangularis* grew by the yard sending out its aerial root bedecked arms three feet long. *Harrasia tortuosa* became corpulent—its new growth having twice the diameter it had had before. Indeed the response of the plants in growth is so great that they seem to be entirely different plants.

The glochids of such species as *Opuntia microdasys* and *O. rufida* remain new and bright much longer than previously. *Echinocactus grusonii* has larger areoles whose tufts of yellow make it much more the "Golden Ball" of catalogue descriptions than I had thought possible.

Aporocactus flagelliformis dropped its ropy streamers to much greater length and the *Epiphyllum* branches simulate for all the world the fronds of a lush fern. They are, of course, too crowded in the little house and invite one to lift them out, the better to admire them as they stand alone.

The unspoiled blue bloom of the new growth of the *Myrtillocacti* seems to be a reflection of the sky and even the gray somber face of *Lophophora williamsii* is gayer.

Now, for the first time, *Cephalocereus senilis* and *Oreocereus trollii* are able to demonstrate the true beauty of their hair-like spines. *Mammillaria bocasana* its fluffy whiteness and *M. plumosa* its feathered loveliness.

Another condition within the little house, and one for which I have been pleased with the least, is that

there has been less flowering than last year. My plants had outgrown their pots, having used up the soil and almost breaking the pots. Most of the plants were shifted this past spring and although only to the next larger size pot they failed in flowers and, encouraged by the more ideal conditions within the house, they just grew.

The house has proved also a most excellent place for the making of grafts; some plants were thus saved that were about to perish due to an unwise experiment with guano. A few years ago I received an *Echinocereus pacificus* which was doing nicely until that experiment. Rot seized it and I despaired of saving it. Carefully removing all decayed tissue I then grafted the tip on a stock of *Hylocereus triangularis* and now have a fine healthy plant 4 inches high and about 2½ inches in diameter. Minute tip of a rotting *Echinocereus merkeri* is become a 2 inch growing plant by the same method. This latter on a stock of *Acanthocereus pentagonus*.

Harrisia martinii was also refusing to thrive. Its stems became limber and watery. A 1-inch tip grafted on *A. pentagonus* has done phenomenally well and grows with amazing rapidity. *Echinocereus pentalophus* and *Rhipsalis cereuscula* have also taken well on *A. pentagonus* stock, as has also my first successful graft of *Wilcoxia poselgeri* made on a vigorous Opuntia stock, the species of which is unknown to me.

Several species in my collection were suffering from an affliction which causes the surface of the plant to become spotted with brown, dead-appearing areas. These spots became hard and the plant shrunken and unsightly. I had always supposed the plants would eventually die and discarded them to prevent its spread to other plants. When it appeared on my seedling *Astroyphtum asterias,* however, and I was informed that thrip caused the attack, I isolated the plant, sprayed it and the plant seems to be recuperating and almost as good as new. *Homalocephala texensis* was infected, worse than any other plant, by this ailment. Almost the entire surface was brown. I removed one whole rib and part of another which were still green and intended to have a try at rooting them. The plant I tossed on the refuse pile to be burned. In some way it rolled free of the pile, escaped destruction, and when I discovered it weeks later it was growing! And indeed now gives promise of surviving both the disease and the mutilation.

Among those plants which flowered this year are the following: *Hamatocactus setispinus*. For me this is a champion bloomer, producing flowers from early spring to late fall. *Opuntia compressa.* This hardy fellow blooms only in the spring, but it is an extremist when it does flower, covering itself with a coat of yellow when any color is a welcome relief from the drab of winter or the white of snow. *Mammillaria plumosa*—trying to hide its small white flowers in its feathery spines. *M. multiceps*—many heads and many flowers. *Aporocactus flagelliformis*—blooms on a sash-cord. *Echinocereus rigidissimus* and *E. reichenbachii*—vying their pink beauty. *Lophophora williamsii*—pink also like a tiny jewel on the stone gray crown. *Epiphyllum* species? Red flower. A common plant in homes here and called by house wives "Cup and Saucer Cactus." *E. latifrons*—bewitching the night with its fragrance. I always feel that I should approach the bloom on tip-toe. Each blossom, a Cinderella for one night is an adventure in loveliness.

Now I am a little sad as the time draws near that I must bring them indoors because I am unable to heat their little home and keep them there throughout the winter.

As I write, the fringe of a tropical hurricane which is tearing the Eastern coast has struck us here and my garden is a shambles. More then ever now I am glad my cacti are safe within their little house.

ROBERT H. WALKER, Elverson, Pa.

ADDITION TO BRITTON AND ROSE

I should like to suggest a feature which could be run in installments in the *Journal,* and which would be of great value and interest to a large number of your readers.

Since the publication of the great monograph by Britton and Rose, many new species and genera have been described. Also, in numerous cases, the classification of species listed in *The Cactaceae* has been changed. Now to a great many of us, especially those whose interest in cacti is of fairly recent origin, the descriptions of these new forms and the discussions of the changed classifications are unavailable, and such information as we can get is often contradictory and confusing.

For example, according to Britton and Rose, the genotype of both *Cephalocereus* and *Pilocereus* is Haworth's *Cactus senilis.* Since the name *Cephalocereus* was published a year earlier than *Pilocereus,* the former naturally has priority and the latter becomes a synonym. According to the rules of nomenclature, the name *Pilocereus* can never be anything but a synonym of *Cephalocereus.* And yet we find a recognized authority such as Backeberg using both names for what he considers distinct genera. In the *Journal* for December, 1937, he speaks of *Cephalocereus senilis,* so apparently retains that species as the genotype of *Cephalocereus.* But in the same article he used the term *Pilocereus* for a group of species which Britton and Rose included in *Cephalocereus.* Now granting, for the sake of argument, that this group is sufficiently distinct to warrant its separation as a distinct genus, still the name *Pilocereus* is a synonym of *Cephalocereus* and cannot be used legally in any other sense. If the group which Backeberg calls *Pilocereus* is a distinct genus, one of its species should be designated as the type of a new genus and a new generic name should be coined for the group.

I could cite numerous other cases in which present usage is confusing and, apparently, indefensible. However, this one instance is typical.

Now it occurs to me that the *Journal* would be doing its readers a real service if it would publish a series of articles in which all species listed by Britton and Rose, and which no longer are classified as in *The Cactaceae,* were briefly discussed. The species, for ready reference, should be taken up in the same order as in *The Cactaceae.* First should be given the name according to Britton and Rose, then the name now in use. This should be followed by the name of the authority who made the change and a number which would refer to a bibliography listing the publications in which such changes were made. This should be followed by a brief comment on the reason for changing the classification in the case of species, and, perhaps, a paragraph or so in the case of genera.

Such comments would be a big help—for example, why have the names *Mammillaria* and *Pilocereus* been resurrected when, according to Britton and Rose, the former is preoccupied and the latter is a synonym?

The list itself would serve a good purpose—Britton and Rose list a *Cephalocereus leucostele* but I have been unable to find it offered in any catalog. I do, however, find a *Stephanocereus leucostele.* Is this the same species transferred to a new genus, or is it an

entirely different species? Such questions as this would be easily answered if such a check list were in existence.

I wish you would consider this idea as a possible successor to the glossary which you are now printing.

JOHN W. SKINNER, Texas.

EDITOR'S NOTE: This is exactly the work being done by the Nomenclature Committee and publication (in the *Journal*) of one genus at a time is assured in the near future. The final results will be a continuation of *The Cactaceae* as was planned at the time of the reprinting. Pres. Marshall will probably be the first to review his assignment of Ferocactus. Dr. R. W. Poindexter should then be ready to report on Echinocereus, Dr. Craig on Mammillaria, Ervin Strong on Coryphantha. It is a satisfaction to see this committee, now two years old, ready to present its findings to the Society.

MORE ENTHUSIASM IN WISCONSIN

The November *Journal* just arrived and your editorial on page 72 and the suggestions from Chas. R. Cole of the K. I. O. Cactus Club are particularly of interest to me—I would like to tell "Why I Like Cactus."

As an amateur, the care of cactus started me in raising and collecting cactus for rock garden purposes about six years ago. The first rock garden was built in Fond du Lac, Wis., and after reading for an entire winter, all the data that was available in the public library we set out to prepare the bed of the garden.

To do this all the garden soil was dug out down to clay subsoil and filled in with ashes, broken limestone and cinders and good drainage was established direct into a ditch that drained the entire garden.

The growing soil was scientifically mixed by using garden loam, sand and crushed plaster. Then we hauled the limestone rocks from their natural resting places on a ledge about four miles from home.

As you can see this really was good exercise for a man doing office work exclusively and is reason No. 1 for anyone to start to raise cacti.

The first year we had few plants of the various cactus families and had to be satisfied with other rock garden plants and tulips. However, interest soon grows and we started to get the urge for more cactus and the next April saw my wife and I in Texas on a vacation collecting cactus. This collecting of cactus plants in their native habitat enables one to meet really fine people and results in finding far off and hidden places that few other people get to know, especially along the Mexican border. Our first collections were brought home under the seat in the Pullman Sleeper.

Two years later we made another such trip to other parts of Texas and mixed vacation with cactus collecting, visiting fine gardens in Houston, Galveston, and San Antonio, also collecting cactus in their wild state. This is reason No. 2 for liking cactus.

Next comes the 3rd reason which is the work required to make a catalog list of what you have—which we did in loose leaf form so we could add to it. To start, we used Houghton's *Cactus Book* from the library and gathered all the old catalogues so we could get the names properly fixed in the records. By this time some correspondence had been established with cactus growers and we found some very interesting hours were required to start our education. Bear in mind ours was the only cactus garden in the vicinity where cactus was grown outdoors and what was learned was largely of a self-educational character and kept us on our toes to get things going properly. This takes up considerable spare time and, strange to say, there is never a dull moment.

Reason No. 4. Our family consists of five sons and three daughters also one grandson, three years old, and the entire family now is enthusiastically interested in the cactus collection growing in the rock garden and many indoor and outdoor pictures are taken by them and we know that the appearance of the back yard is responsible for the entire family gathering around to see what father is doing now or is going to do next. Friends drive in from other points to visit and talk cactus and we know of seven other cactus enthusiasts that started after visiting our amateur garden. Many of their first plants, especially the larger Opuntias, were obtained out of our rock garden.

Reason No. 5. Raising cacti will positively keep you from growing old as it keeps alive one's enthusiasm as there is always some new idea or new plant to interest the amateur and what ideas crop up have to be followed to conclusion as a real dyed in the wool cactus enthusiast never gets tired and is forever experimenting. For instance we tried keeping our cactus in pots and put up plate glass shelves at windows in kitchen and dining room and had a grand display, but had to do away with this scheme entirely and replant them all in home-made boxes and winter them in the basement where light is available as the living rooms are too hot and dry. This we learned by reading an article in the *Cactus and Succulent Journal* by a lady in Seattle, Wash. Since then we have lost no plants in the basement. We merely plant them in soil from the garden and water about once a week when they become dry. From now on pots are out.

Reason No. 6. Hard work is better than any medicine and anyone who does not like to work in the sun had better not start on cacti. For instance, last November we had to move to Stevens Point after we had the entire rock garden cactus taken in for the winter and had to move by train. We worried more about the results of moving the cactus than we did about all the rest of our possessions. Yes, we lost some from handling and this spring we had to build an entirely new rock garden and the house was picked out due to the proper south and east exposure to get sun for the cactus. This is sandy soil and we had to dig the rocks from the Wisconsin river and get leafmold to mix in the soil, also hunt broken plaster. Last summer we were rewarded by many nice flowers on them even though the plants were roughly treated. At this time, November 26, all the less hardy plants are in boxes in the basement and we are the only ones in this town of 1400 to grow cactus. A new experiment is being tried out this winter. We are leaving outdoors all of the hardy Opuntias that we know have already withstood freezing to see what 30 degrees below zero will do to them. If this is successful we expect to take a load off people's minds caused by the worry of keeping cactus plants in this climate during winter.

Reason No. 7. Raising cacti and having a greenhouse for them and tulips and hybrid roses will be our job to tend during leisure time when we are pensioned on the railroad. Right now we do not have enough time in daylight to do things properly. We are going to build a new house with greenhouse attached so we can get the heat and all this comes from a start of one cactus plant. Next April another trip has to be made to Texas and Arizona and with all this outdoor exercise you can believe it or not I have gotten rid of hay fever which used to put me nearly out of commission. This is my favorite reason for being

thankful that there are cacti and after the rock garden is planted there is not really so much to worry about until next winter.

As a tip to others, we get good results by feeding the tea roses liquid manure once a week and we give the cactus plants the same food by pouring on the ground near the plants, never touching the plants. We also water them when dry and never have any sun scald and, strange to say, have very little occasion to spray and when we do we dust with "masseys" dust same as the roses get—as we have had some scale.

I believe if anyone shoots the question at me as to why I like cactus I can answer at the first shot and actually show him the results of amateurs. Good luck to you and your fine *Journal*. Wish I could afford more time and money to cactus.

J. H. MARTINI, Stevens Point, Wis.

FROM VIRGINIA

The Editor's contention is correct, in *Cacti for the Amateur*, that succulents can be grown as successfully, if not more so, in fancy, glazed pots than in the terra-cotta type. On the other hand they are much more pleasing to the eye and easier to keep clean than clay pots. When I do use clay pots I first paint them to suit my own particular scheme. When I first painted pots I merely coated the outside and an edge on the inside sufficient to come down to the soil line. Much to my chagrin I found that this lazy method soon became more of an eye-sore than a beautification for the sun raised blisters which soon caused the paint to peel. Believing that this condition was caused chiefly from moisture seeping through from the inside I painted my next batch thoroughly on the inside also. Thereby I proved a belief of my own for I lost no more paint.

On the other hand experience has taught me that pots treated in this manner are easier to clean should you find that they contain a diseased plant. All collectors know that cleaning the plant is only a part of the job and that a clean pot or container is also a necessary element toward successful culture. Clay pots contain many small pores as they are more or less porous. Painting these types of containers not only eliminates the soil's immediate contact with the pot from becoming too dry and parched but it also seals the pores which can and do harbor microscopic germs.

I recently came across an interesting occurrence which was new to me, yet may be common knowledge to all other collectors of succulents. Sometime ago I received a plant of *Crassula collinberi* from a dealer and found, upon its arrival, that one leaf was broken half way across its width. However, as the tip end did not seem to be suffering from this partial amputation I decided to let it remain and see just how long it would live while receiving nourishment from but half of its source. That was on the 17th of August. By October 1st the plant was carrying a four-inch stalk topped by a four-inch cluster of pretty but small flowers. The last of them are dying today, the 3rd of January.

The plant is now carrying six suckers or offsets. But the interesting fact about this plant, as mentioned above, is that one of these offsets was born in the cleft of the broken leaf and upon close investigation showed that this baby was *not* attached to the lower part of the leaf, but from the *tip end* which was living on the sustenance of but half its normal source.

It is also my conviction that even plants are fooled by their Mother Nature. The weather here in Virginia during the Christmas holidays has been as warm and sunny as our month of May. Regardless of the fact that we are in the heart of winter, my daffodils are up two inches and my cacti and succulents are putting on new life while my *Opuntia* is starting five new pads regardless of the fact that they have not had a drop of water for well over two weeks.

I only hope that freakish weather and pre-normal growth will not be detrimental to the plants by causing unnatural shapes. W. E. J. GOTTSHALL.

WHEN AND HOW TO OBTAIN PLANTS

Lesson Sheet for the Oklahoma Society Jan. 5, 1939

By JAY E. GILKEY

The subject of this lesson is "Where and how to obtain plants." To begin with, there are several ways to obtain plants so I will start off on how to obtain them. The first way is to go to a friend's home who has some plants and admire them very highly. He may have an extra one that he will give you, or if you see a nice plant with some babies on it, tell him how much better it will grow if he will take off a few babies or at least one—and you are pretty sure to get one. Other ways to obtain them is to beg, borrow or steal, buy or trade.

The best way and the most enjoyable way is to go and get them from their native haunts. Even that way has its drawbacks. Some people like to get up early and get a good start so they will be there before the sun gets up too high, but some like to stay in bed a little longer. When a bunch is going on a field trip, we have a place and time to meet and all had better be there on time. You can expect most anything to happen on these trips as we come in contact with snakes, spiders, scorpions, centipedes, cattle and goats. You have to watch when getting cacti as many of our field trips are where there are a lot of cattle, as one of our lady members of our Cactus Society will vouch for. She was after a nice specimen of a plant which led her too close to a steer. Not being cut out for a matador, and having no spear for protection, she made a run for the fence, clearing it without the aid of anybody. She made a perfect two point landing and the mean old steer made a wreck of her beautiful red straw hat. (She got the cactus). As a rule the cattle are in pastures where there are Echinocereus growing. The *Coryphantha vivapara* seems to like the flat country and black dirt.

Another one of our lady members was hunting some plants when she came upon one she liked real well. When a cactus fan is after a plant, his mind is on nothing around him until said plant is in possession. This happened to be the case of the lady above. As she bent over to dig up her plant she felt a jolt from the rear. On looking up, she looked in the face of a nice big billy goat. I never did find out who won or what happened but I do know that she is still altogether and still with us. Her warning is, "Never entice a goat but always face him as you will have a better chance to get away."

One place to get plants is to send to the Department of Agriculture at Washington, D. C., and ask for an application blank to import plants. The other way is to subscribe to the *Cactus and Succulent Society Journal* and patronize the dealers who advertise in it. They are the ones who are helping keep our *Journal* going and it is up to us to help by helping them.

I want to thank you very much for the grand book, "Cacti for the Amateur," which was the nicest Christmas present I received. It is really the one book best suited for every Cactus lover.

A. Buschmann, N. J.

NEW 1939 YEAR BOOK

The Cactus and Succulent Society of Oklahoma has issued its fourth Year Book. The new officers are:

Officers: President, Mrs. Jas. H. Hyde; Vice-President, Mrs. S. P. Seela; Secretary-Treasurer, C. L. Wiese; Parliamentarian, Jas. H. Hyde; Historian-Librarian, Mrs. J. B. Lankford; Representative to Garden Clubs Council, Mrs. T. C. Kelk.

Board of Directors: Mrs. Jas. H. Hyde, Mrs. S. P. Seela, C. L. Wiese, Mrs. G. W. Biggers, Miss Cleta Stubblefield.

Contact Committee: Mrs. Harry T. Johnson.

Telephone Committee: Mrs. Jesse Vandenburgh.

Flower Show Committee: Miss Cleta Stubblefield.

Projects Committee: Jay E. Gilkey.

Publicity Committee: Local, Mrs. Winnie E. Jones; General, Mrs. S. P .Seela.

Honorary Members: Mr. H. O. Bullard, New Jersey; Dr. George L. Cross, State University, Oklahoma; Mr. S. H. Davis, Davis, Oklahoma; Dr. Milton Hopkins, State University, Oklahoma; Mrs. Marion Sherwood Lahman, Tulsa, Oklahoma; Mr. J. F. Newberry, Davis, Oklahoma; Mr. Henry Walter, Botanist, Will Rogers Park Conservatory, Oklahoma City.

The program committee announces the following topics for the meetings for the entire year:

January Fifth: Where and How to Obtain Plants, Jay E. Gilkey; *January Nineteenth*: A Beginner's Collection, Mrs. T. C. Kelk; *February Second*: Three Distinctive Desert Plants, Marjorie H. Lee; *February Sixteenth*: Questions, Answers and Discussion, Committee to be Appointed; *March Second*: Preparation and Care of Outdoor Gardens, R. A. Chubb; *March Sixteenth*: Defining Pereskieae, Opuntieae, Cereanae and Hylocereanae Families, C. L. Wiese; *April Sixth*: Plants from Other States Hardy in Oklahoma, Mrs. A. C. Holding; *April Twentieth*: Book Review, Mrs. Jesse Vandenburgh; *May Fourth*: Questions, Answers and Discussion, Committee to be Appointed; *May Eighteenth*: Miniature Cacti for the Home, Mrs. Winnie E. Jones; *June First*: Landscaping with Desert Plants, Henry Walter. Outdoor meeting at Kelk's Country Home, West 10th; *June Fifteenth*: Illustrated Lessons on Grafting, Mrs. W. E. Smeltzer. Outdoor meeting at 1411 N. W. 47th; *July Twentieth*: A Starting Box for Cuttings, Mrs. Jas. H. Hyde. Outdoor meeting at 122 N. E. 11th; *August Third*: Questions, Answers and Discussion, Committee to be Appointed. Outdoor meeting at 1640 N. W. Park; *August Seventeenth*: The Cactus Hobby as a Form of Recreation, Geo. W. Kline. Outdoor meeting at 3312 S. Shields; *September Seventh*: Three Distinctive Desert Plants, Jas. H. Hyde; *September Twenty-first*: Winter Care of Cactus Collections in Oklahoma, Harry T. Johnson; *October Fifth*: Window Gardens of Mixed Succulents, Harold Whitley; *October Nineteenth*: Defining Coryphanthanae, Epiphyllanae, and Rhispalidanae Families, Mrs. S. P. Seela; *November Second*: Questions, Answers and Discussion, Committee to be Appointed; *November Sixteenth*: Euphorbias of Oklahoma, Dr. Milton Hopkins; Motion Pictures in Color, Cactus Plants and Gardens, Dr. Geo. L. Cross; *December Seventh*: Three Distinctive Desert Plants, Miss Cleta Stubblefield; *December Twenty-first*: Christmas Party, Mrs. Jas. H. Hyde; *Substitute Lessons*: Plants Other Than Cacti for the Desert Garden, Jay E. Gilkey; What the Cacti Mean to the Desert Dwellers, C. L. Wiese; The Lure of the Desert, Mrs. S. P. Seela; Desert Trails I Have Followed, Mrs. J. B. Lankford.

This live group in Oklahoma is to be complimented on the thoroughness of their plans. Any organization that plans topics for the entire year is bound to have a good attendance of loyal enthusiasts. The suggestions for forming a society which appeared in *Cacti for the Amateur* were patterned after the Oklahoma affiliate.

The Cactus and Succulent Society of America will print some of the papers used for the Oklahoma meetings so that other affiliates may share their excellent work.

FLOWERING NOTES FROM WISCONSIN

The flowering season here in Wisconsin is, generally speaking, from May until September, inclusive. This does not include the leafy types such as Epiphyllums which bloom at various times during the year.

All of the Gymnocalyciums bloom well and usually last for four or five days. Lobivias and Rebutias also grow and flower well here. At this date, August 29, *Leuchtenbergia principis* is in bloom. *Epiphyllum oxypetalum* has bloomed four times this year at intervals of ten days starting in July. Echinopsis is also a good bloomer here. Of course most Opuntias bloom well but last only one day.

Some of the Texas varieties also do well and start to bloom in April. Some good bloomers are *Echinocereus reichenbachii, Mammillaria decipiens, Opuntia macrocentra, Echinomastus johnsonii, Ferocactus wislizenii, Lophophora williamsii* and *Astrophytum asterias.*

Neoporteria napina has been in bloom since May almost constantly and is still budded so will still be in blossom in September, which will be a five-month blooming season; they last two days.

Strombocactus schmiedickeanus, although small, gets two flowers at once which it has done five times since late June but the flowers last only one day.

In May *Aporocactus flagelliformis* was in bloom. One of my plants in an 8-inch pot had 105 flowers in two weeks and they last about three days before wilting.

Hamatocactus setispinus has blossomed during July and August and has had 37 flowers so far and still has numerous buds. This plant is five inches tall. *Chamaecereus sylvestrii* is a good bloomer and flowers during July for about two weeks. *Mammillaria boscasana* and *M. longicoma* also bloom well during July. Most of the Mammillarias flower here during June, July and August.

I have mentioned cacti that most of us are familiar with, but in my collection of several hundred plants, both native and imports surprise us with a nice blossom here and there during June, July and August.

PHIL OLSON, Waukesha, Wis.

EDITOR'S NOTE: This interesting list is exactly what many readers need so that they may obtain flowering kinds. Please send us flowering lists of succulents from all sections of the country.

DELAWARE NOTES

SEPTEMBER

Before I left on my vacation I set all my pots in water till the moisture just showed at top of soil, then set them on top of dampened peat moss. The plants were all in fine condition; two plants, *Rhombophyllum nellii* and *Lithops bella,* were damaged due to a mouse eating on them. The colored outer skin on half of *Lithops bella* was eaten till the clear green inside showed.

Two *Harrisias,* 13½ inches and 14½ inches high, are the tallest plants I have; the others are 1½ inches to 8 inches tall. Later in this letter you will see why I mention this.

Thank you for sending me the names of some of the Milwaukee branch of the Cactus Society. During one day, made three calls at homes; two were out and the third one had moved. But luck was with me at the fourth place, which happened to be four blocks from the home I was staying at during my visit. Judging from my collection which is small and easily looked at in fifteen minutes, I promised I'd be home in plenty of time for a party at 8 p. m. At 7 p. m. I presented myself at the door of Mr. Max Jaehnert and was shown to the greenhouse which he had constructed at the rear of his home. Now if what comes next is not right, either Mr. Jaehnert or Mr. White, the Secretary of the branch, can write in with corrections, as I was dazed by what I saw. There were 600 cacti all under one roof before my eyes with one *Epiphyllum oxypetalum* opening up, and two flowers that had opened the evening before; this plant having 16 flowers open in a season. There were two *Cactus intortus* 12 inches high and one 12 inches wide, this minus the cephalium which perched on top. *Cereus peruvianus* 8 feet high and a monstrose specimen of the same plant was 1 foot high. There were six *Leuchtenbergia principis* 8 inches to 10 inches in diameter, the stems 4 inches in diameter, all blooming size. *Aporocactus flagelliformis* grafted on *Nyctocereus serpentinus* two years ago had to be wired up and was 20 inches across. A Christmas Cactus grafted on *Selenicereus,* in two years, had grown from a single pad to 22 inches around and had 300 blossoms last Christmas time. A *Mammillaria plumosa,* 1½ inches in diameter 14 months ago, was grafted on *serpentinus,* had 28 heads ranging in size from 1 inch to 2½ inches in diameter. There were quite a few *N. serpentinus* to be seen of different heights, which were for stock, but a 7½ foot one was left exclusively for flowering. A *Chamaecereus sylvestrii* grafted on *Acanthocereus pentagonus,* two years ago, had sprouted out to 9½ inches in circumference and 1 foot high, the longest Peanut Cactus I've seen. *Rebutia minuscula* grafted on *Selenicereus macdonaldiae,* 1½ years ago, was 3 inches in diameter, and 6 around the main plant ranging from 1 inch to 3 inch in diameter. An Old Man (I guess it was *Cephalocereus dybowskii*) 11 inches high and 4 inches in diameter, which he obtained unrooted two months ago, had rooted. *Lemaireocereus pruinosus monstrosus* was 3 inches in diameter; 18 assorted *Astrophytum;* from 1 button of *Mammillaria multiceps* about 13 years ago had now grown to three 6-inch pots solid with Mammillarias. An *Echinopsis tubiflora* crest grafted on *Trichocereus spachianus* was 6 inches across and 4 inches thick. An *Aloe arborescens* was 5½ feet tall and 30 inches across, 2 stalks; a *Euphorbia tirucalli* was 4 feet tall and 3 feet across; *E. ingens* crest 10 inches high.

There were many kinds of Mammillarias, from pans of seedlings to blooming size plants. A *Bryophyllum tubiflorum* about 4 feet tall was to be seen. An Opuntia with stems 12 inches to 15 inches across; a few Gasterias and a few Haworthias. Hanging from the beams were pots of orchids and many other plants I had no time to write notes about; there were 200 grafted plants all doing fine.

During this question and answer time, in came Mr. White, just back from Texas, so you can use your imagination of how I was asking questions. My throat is still sore, but the two men were very kind and answered all the questions. All thoughts of the party awaiting me had completely gone, till Mrs. Jaehnert tells me at 9:45 that when I am ready to go home I should call and some one will get me. But before I left, I was shown where all these lovely plants were placed during the summer. Nearest the walk is a sloping section, empty now, where they are kept. Similar to a greenhouse construction are pipes and along the sloping top a canvas is unwound when too much rain comes. Back of the cacti is a large tree under which wild ferns and flowers of the state grow; to the side of these is a lily pond with the electric lights placed in the water to illuminate the pool effectively. There are many more plants, not cacti, which must be a very lovely place to be in during the summer months. Before I left I was given the flower cut from *Oxypetalum* to show the party where I should have been at 8 p. m. On the door of the greenhouse is printed a sign:

One needs a little place
No matter how tiny
Of which one can say,
"See, this is my own."
Here I live. Here I tarry.
Here I play.
This is my greenhouse,
Here I am at home.

I wonder if Mr. Jaehnert knows that a perfect stranger was also made to feel "right at home." When I finally got back to the party, there were many exclamations about the beautiful flower!

The following day I was to have seen Prof. Heun's collection at the school, but before I could get away guests arrived, so that collection will have to be seen another time when we get back to see the folks at home. Also some of the other members I did not get to see this time. MRS. C. NICKOLAUS.

(To be continued)

FROM MICHIGAN

I am a woman suffering from arthritis, and anyone who has it knows how one is affected with it, and one isn't very active. However, much of my time is spent in reading.

One day a friend of mine brought me a cactus plant and a catalogue. I was both delighted and interested and as weeks passed became overpowered with a desire to have a few more. I sent an order, and later joined your Society.

The comfort and interest cactus plants can give a sick person is impossible to imagine. They have brightened my days beyond words.

At first I had great difficulty with the amount of water to give, but after reading Dr. Houghton's book, and losing a few plants I soon learned. Up to date I have had excellent results due to the help of your Society and study.

I keep my plants in groups—medium, arid and dry. I find it helps a lot in the care and amount of sun required.

I would like to see more material printed or hear from some one who has had success with succulents, as I know so very little about them, and have not had great success with them.

I have a home-made box for growing seeds. Heated

with a 40-watt bulb I was able to germinate some Echinopsis seeds, purchased from Mr. Kelly, within four days. I know I would have raised them all if it hadn't been for my daughter's puppy who insisted on burying a bone in my precious seedlings (much to my dismay and horror) every time an opportunity afforded itself. Well, the few I rescued today are little beauties and you can bet I protect them well.

For those who are interested in what plants flower best for me in Michigan I will give a short list. I have one hundred plants but will give only a few as space and time are limited:

Hamatocactus setispinus, bloomed at intervals all summer, a delicate yellow, 3 inches across, with a red throat. *Gymnocalycium schickendantzii,* bloomed in May, June and July, pinkish white blossoms, 2 inches across, lasting 2 and 3 days. *Coryphantha macromeris* (June and July) 3 inches across, a lovely orchid, sleep at night and open the second day. *Ferocactus uncinatus, Echinocereus fitchii, E. reichenbachii, E. pectinatus, Mammillaria carnea, M. kewensis, Thelocactus bicolor, Echinopsis* hybrid, and many more have blossomed for me. I have many that have not yet blossomed, and some refuse to give me a bloom.

May I add that I have two cacti all in bud (Dec. 20). I counted nine buds on *Ancistrocactus scheeri.* My Christmas cactus is in bud. It sure is my problem child, but I have a few blooms anyway.

My grafts are coming along wonderfully and I do hope Santa will be good enough to bring me one or two white-haired ones. If I don't get any I'll get some seeds from Mr. Kelly and raise my own.

I was in a convalescent home for a month for rheumatism and my doctor, on visiting me one day, mentioned my hobby to the supervisor, I was really too ill to speak of anything. Two days later she walked into my room with two lovely cacti. One is an Opuntia, the other I don't know yet as she didn't ask. But I was so delighted to receive them that I forgot the pain. In some ways it pays to be ill for I always get a few more plants to add to my collection, but the pain is terrific. Anyway once more my hobby made me forget.

MRS. ANN LABADIE, Detroit, Michigan.

OFFICE BEARERS FOR 1939

CACTUS AND SUCCULENT SOCIETY OF AUSTRALIA

President, Mr. C. J. Hodgson; *Vice-Presidents,* Mr. R. Burbury, Mr. F. Smith; *Hon. Secretary,* Mr. J. S. Thonemann; *Hon. Treasurer,* Mr. J. G. Donaldson; *Committee,* Mrs. Lennon, Miss Glasson, Miss McDermot, Mr. E. Burbury, Mr. A. E. Hicks, Mr. Y. A. R. Taylor.

SEASONAL NOTES IN AUSTRALIA

(From a lecture by Mr. Chas. G. Hodgson. Printed for distribution for out-of-town members.)

With the approach of warmer weather (September in Australia starts their spring season) the present is a good time to overhaul your plants. After the resting period, mainly in the case of plants in pots it will be found that some have lost their roots. In other cases some may be affected with mealy bug, etc. Plants that have grown well during the previous season, will require larger pots.

I would suggest that some flower pots of various sizes be procured. If new flower pots are purchased it will be necessary to soak them in a bucket of water, where they should be left until the air-bubbles cease to rise in the water.

Secondhand pots should be thoroughly washed. The cleaning of old pots is very necessary for the well-being of the plants.

Procure some broken flower pots, charcoal (when procurable), and some moss, to be used for drainage; the materials for potting, such as coarse sand, some mountain chocolate soil, or, failing this, some black sandy peat, to which some powdered cow manure is added. Shell-grit is also valuable when mixed with the soil. Procure some small boxes or trays, so that the various materials can be kept separate and used as required.

Drain some pots as follows: Place a piece of broken flower pot over the drainage hole (this should completely cover the hole). Over this place some crushed flower pot, broken charcoal, or coarse shell grit. Quarter-fill the pot with drainage, and over this put a thin layer of moss. (This helps to prevent the soil from filtering down into the drainage, and later, when it eventually rots, it forms humus on which the roots will feed).

To make a thorough overhaul of the plant, tilt the pot in the hand and gently tap the edge of the pot on the potting bench, and without disturbing the soil more than can be avoided.

An examination can then be made of the root system. If it is found that the roots are healthy and have grown to the side of the pot, they can be repotted into a larger-sized pot; but if the roots have perished or have died back to a few main roots, the soil should be gently shaken out and the dead roots trimmed off with a sharp pair of secateurs or scissors. A clean pot of the same size as that from which it was taken out should be drained as above and filled with soil to within one inch of the top. Then place some coarse sand or fine shell-grit over the soil. Make a small cavity in the sand and merely set the plant in the cavity.

In the case of globular cacti they can be held secure by pressing two small stakes near each side of the plant, and then tie a band of raffia 'round the stakes and plant. In the case of columnar plants one stake and two ties are necessary.

This method of potting allows surplus moisture to get away from the plant, also the sand or grit stimulates root action. Plants treated in this manner require little or no water until new roots commence to grow—which usually takes place when the weather becomes warm.

It will be found sometimes, when turning the plants out of their pots, that they are infested with a variety of mealy-bug which attacks the roots. I find a good method in cases of this kind is to put the hose on the roots with just sufficient pressure of water to thoroughly wash the roots clean. They could be then dipped in a solution of Clensol spray. Plants found to be affected with the mealy bugs on the top of the plant should be treated with the pressure of hose water. This method will be found effective in shifting the pest from between the spine cluster. Later they could be sprayed with Clensol.

After re-potting it is advisable to water sparingly until such time as it is observed that the plants have commenced to make new growth. Then the amount of water can be increased. During warm weather plants that have an active root system can be copiously watered.

Cacti and succulents are sometimes affected by red spider. The presence of this pest causes the plant to have a freckled grey appearance. They can be plainly seen with any ordinary magnifying glass. Nicotine-sulphate will control this pest.—C. HODGSON.

LEFT: Aeoniums, Agaves, Mesembs., and Echeveriaas. RIGHT: Hardy cacti collected by the author—all native to Washington: 3 Opuntias, *Pediocactus simpsonii, Neobesseya missouriensis* and *Coryphantha vivipara.*

Why I Grow Succulents

By ALFRED S. HARMER

I grow succulents for the same reason I grow cactus, because I like them. It takes succulents to show your cactus off, and it takes cactus to show your succulents off; to me they are inseparable.

I have one large succulent rockery that covers 500 square feet and several with cactus and succulents combined. My collection of cactus and succulents numbers over 3000 plants, of which two thousand are succulents. Few succulents are hardy here on Puget Sound as our temperature occasionally goes down to seven above zero, although it does not often get that cold, nor does it last long. There is hardly a winter that we do not have a short cold spell of from three days to a week when the temperature drops to 20 degrees above zero, but for the most part our winters are very mild.

Sempervivums and a few Sedums are hardy, and I have two varieties of Echeverias which have stood the winter so far and for a week the temperature during the night ranged between 20 and 25 degrees F. In the fall of 1937, after I thought I had all my plants safely in the greenhouse I discovered seven or eight of the two varieties had been overlooked and left in the rockery, so I left them there to see how they would winter in the open. Much to my surprise they all lived; of course, we had a real mild winter. This fall I decided to leave a few of these same plants out for further experiments. They are planted in a rockery not six feet from a lily pond that had three inches of ice on it for over a week. Today, the 7th of January, they look just as healthy and fresh looking as plants of the same kind in the greenhouse, in fact they have a better color.

My succulent rockery is built around a lily pond, at the lower end of which is a latice pergola eight feet square which is covered with climbers. I have two rows of shelves on two sides and shelves in the other two corners. Here in the shade is where I keep my Christmas cactus and Epiphyllums during the summer months. Concrete steps lead from the pergola down into the lily pond and on each side of the steps I built a bed 3 feet high and 3 feet in diameter which is walled in with rocks laid in concrete. Concreted into the outside of these two beds are two 1½ inch pipes bent to form an arch seven feet above the steps. A trellis is laid on the pipe and the whole arch covered with English ivy which I keep neatly trimmed. In the center of these two beds I plant a few of the taller succulents and gradually step them down to a row of Echeverias around the outside. At the other end of the pond I built another bed 4 feet high and 4 feet in diameter which is also walled in with rocks laid in concrete. On the outside of the bed, pockets are built-in here and there and succulents planted in them. This sets back about three feet from the pond and from the top I built a waterfall down to the pond six feet below, the water coming through a concealed pipe at the top. At the base of the first waterfall, the rocks are arranged to form a pocket holding

about two inches of water, making a very pretty bird bath which is well patronized both summer and winter.

In the center of this four-foot elevation grows a twenty-five foot weeping willow tree with its graceful, drooping branches spreading in all directions over the whole rockery. The rockery is built on a slope with a 3½ foot drop and is composed of sections of irregular shapes covering from three to eight square feet. Each section is surrounded by rocks of various sizes and shapes laid in concrete.

In the spring of 1938 I planted in this 1000 Echeverias (77 varieties), 10 large Aeoniums and 25 small, 12 Crassulas, 75 Mesembryanthemums, 25 Pachyverias, one three-foot Portulacaria, 12 Faucarias, 6 Cotyledons, 12 Stapelias, 10 smaller sized Aloes, 3 Huernias, 3 Glottiphyllums, 6 Sanseverias, 6 Kleinias, 10 Haworthias, 8 Gasterias, 6 Pachyphytums, 3 Ceropegias, 4 Euphorbias, 148 Sedums, 5 Yuccas, 5 Dyckias, 50 clumps *Crassula schmidii* and 50 other succulents of which I have only one or two of a kind. All specimen plants are planted by plunging pots in the ground.

I placed 25 Echeverias alone in one section and had 25 different shades of green. This made a very pretty arrangement. Echeverias are one of my favorite succulents and they border each section of the rockery.

I installed flood lights over each of my rockeries and during the summer and fall evenings I have my whole yard illuminated. If you have a pretty yard or rockery try lighting it up and you will be surprised how beautiful it looks at night and how quickly it will attract attention. The lights bring out many color effects that you don't see in the day time. It is well worth the few cents it adds to your light bill.

I am now building a desert garden as near as I can make it like the one in Santa Barbara, a picture of which appears in the front of *Cacti for the Amateur* by Haselton. I have several tons of rocks on hand now that I have gathered from all over the western states. I won't have any eight or ten foot Arizona Giants like those shown in the picture, but I have two fine specimens 19 and 37 inches in height, and one *Opuntia ficus-indica* eight feet high and quite a number of the large barrel cactus.

When I built my rockery I had no intention of planting it with succulents. I went to a nursery and purchased several hundred rock plants, the majority of which flowered only once in the early spring. They were beautiful while they lasted, but in a week or so they quit flowering and were just an eyesore from then on, so I pulled them all out and threw them away and replaced them with what succulents I had at the time, which was just about one quarter the number I really needed. This was in 1934 and it has been planted entirely with succulents ever since. In this rockery I had 360 Echeverias in bloom at one time, many of them having from five to seven flower stems and very few of them had only one. The small Crassulas and the Mesemb's flowered all summer long. I had 25 large clumps of *Sempervivum arachnoideum* that made a wonderful showing of their bright flowers. My Stapelias and Heurnias bloomed well too, one Heurnia had 125 dark red flowers* open at one time and now in midwinter it is loaded with buds again.

There is scarcely a day in the year that I don't have either a cactus or succulent in bloom. Succulents, however, are the best bloomers for me, especially during the winter months.

One of the most important things about planting a succulent rockery, I think, is the way you arrange your plants. I plant mine so that every plant shows. With Echeverias and Sempervivums of so many different shades and sizes a very pretty arrangement and color effect can be worked out.

I can boast that my collection is free from mealy bugs, scale, red spider and nematodes. I spray all of my plants every two weeks with Union Oil Spray.

Come on Rock and Desert fans, let's hear from you. If you are ever up Puget Sound way come and put your name on my guest register—"Welcome" is written all over the mat.

Dieringer, Wash.

I received the book *Succulents*, also copies of *Cactus Journal* for which I thank you, also I received the book *Cacti for the Amateur*. Words fail me in my appreciation of such interesting works. The latter book will be the most constantly referred to book in my library. Referring to the *Journals*, I read every line therein, they are so interesting I almost feel that I know personally the various writers of letters and articles in each issue. The Pronouncing Glossary is a great achievement and I hope you meet your objective in membership so that it may be possible to have colored plates in the *Journal*, thus making it the greatest work of its kind in the world.

In the June issue under an article headed "From Oklahoma" I see a paragraph as follows: "Mrs. Harry Johnson: Meters, decimeters, centimeters and millimeters, oh, heck! what size is it anyhow?" That is what I always want to know myself. In Australia we do not use the metric system and I am always asking my young son about how big a centimeter is in inches, etc. However, I am getting used to it now and bow to the custom. *Hal Crook, N. S. W., Australia.*

**Mr. White and Mr. Sloane please note.*

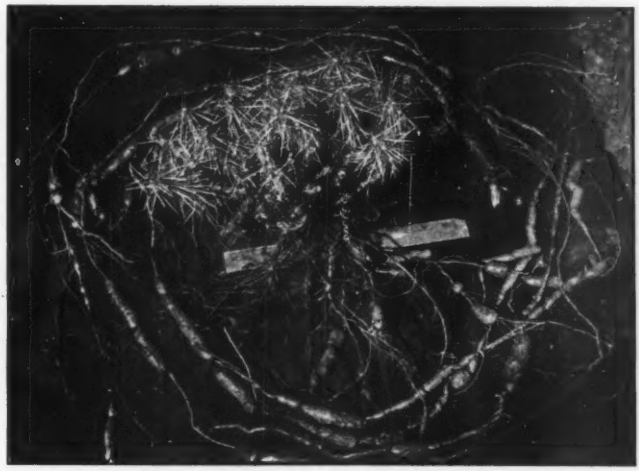


Photo of *Opuntia davisii* showing a small plant and the tuberous, nodular roots of it and another plant. These plants are rare and Mr. Hester reports finding one small colony on the Rio Grande and one in the Big Bend in W. Texas near Marfa. Plants are usually 2 ft. high and appear larger, due to their sprawling habit. They grow at 4500 ft. elevation. The tuberous roots are just below the ground's surface and in sandy soil. Photo by J. P. Hester.

New Species of Cacti

A Preliminary Description

By J. PINCKNEY HESTER, Phoenix, Arizona

My master mania or favorite hobby since 1930 has been hunting for new species of cacti, principally in West Texas, New Mexico, and Arizona, with trips into California, Nevada, Utah, Colorado, Wyoming, Montana, Idaho, and Oregon.

As I peddle no plants and have no cactus garden, my only recompense for the time, money and the endless labor of love lavished on this hobby is limited to the ecstatic thrill of discovery and the hope of having an old bachelor's name borne down the corridors of Time by some of the new species of cacti that have been or will be discovered by me.

To conscientious field observers it is a difficult—an exacting hobby, requiring comparison of material from many regions. None but those with an incurable itch for publicity or a pseudo-scientist would stoop to describe a new species after seeing but one, two or a few plants, which might by hybrids or "sports."

I've just returned from my third trip into that cactus hunters' paradise, The "Big Bend" region of west Texas, having hunted cactus there first in 1930 and again in 1934. I spent the months of May and June there (1937), collecting many specimens each of several new species, including an Opuntia similar to *O. stanlyi,* 2 or 3 Echinocereae, 2 or 3 Echinomastanae, and 2 or 3 species of *Escobaria.* All the above species are from the "Big Bend" of West Texas except two of the Escobarias which have their habitat in New Mexico and Arizona. Our "Copper State" was not known to contain a member of genus *Escobaria* until I discovered one this summer on a limestone mountain but 20 or 30 miles from where I'd previously found them in New Mexico.

Many specimens of species described below are now under the critical eyes of Arizona's premier botanist and cactus specialist, Prof. J. J. Thornber, U. of Arizona at Tucson.

To those of us who desire to describe new species without access to cactus bibliography, the most prudent plan seems to be that practised or pioneered by Ex-Pres. Howard E. Gates, who wrote preliminary descriptions of his new species from Baja California, giving each a number. That method invites information and friendly criticism and might thus enable an author to avoid the embarrassment of describing as new a species that may have been previously described in some foreign or obscure U. S. A. publication seldom seen by cactus enthusiasts.

It is probable that specimens of some of the species described below have been distributed by commercial collectors, some of whom are evidently not so interested in the differentia that separate species as they are in a possible profit.

With one or two exceptions no type locality of the species will be given in these preliminary descriptions, but in the final descriptions, if, as, and when they appear.

H-17) An opuntia of the clavatae type, similar to but a bit smaller than *O. stanlyi,* that flourishes over many square miles of diverse terrain along the Rio

Grande around Candelaria, Texas. These cacti disappear not far below Candelaria, and, after a few miles, are succeeded by a similar type, *O. grahami,* which is widely distributed in the least elevated parts of the "Big Bend." Preliminary description: plants procumbent, in clumps to 3 meters in diam., spreading along the ground by means of new joints which usually send out fibrous roots from areoles touching the ground. Joints clavate, dull green, strongly tubercled, outer half curved upward, to 10 cm. long and 5 cm. in diam. at outer end, tubercles to 3 cm. long, 1.2 cm. high, and 0.7 cm. thick; spine areoles, at upper end of tubercles, circular, 5 to 8 mm. in diam., short white woolly at first, nearly glabrate in age; just above and adjoining the spine areole is the flower or auxiliary areole, covered with short, white, acicular spines and yellow glochids, 4 to 5 mm. in diam.; radial spines 7 to 10, acicular, whitish, 1 to 2 cm. long; central spines 5 or more, some of them angled, 3 to 5.5 cm. long, divergent, pale brownish yellow at first, a dirty gray in age; each spine cluster has 1 large, porrect central spine, subulate, lanceolate, yellowish brown mid-section with paler margins, to 3 mm. broad at base and 6 cm. long; no spine sheathed at any age; ovaries light green, clavate, 3 to 4 cm. long and 1.2 cm. in diam. at outer end, fluted by long, low, narrow tubercles, the upper end of each terminating with a fleshy, pinkish leaf, more or less terete, acute to apiculate, 8 mm. long, 3 mm. in diam. at base, in axil of which is a mass of white wool and a few short, white, acicular spines; flowers, pale yellow, rotate, about 7 cm. across, open about noon, usually for 1 day only; outer perianth-segments about 8, fleshy, obovate, coarsely apiculate, tinged with carmine along midrib, other parts pale yellow; inner perianth-segments about 11, obovate, truncate-apiculate, sometimes more or less fimbriate, pale yellow, 3 cm. long and 2 cm. wide; filaments numerous, sensitive, greenish yellow; anthers linear, 2 mm. long, obtuse, yellow, notched at base; style stout, 3.5 mm. in diam., palest yellow-white; stigma lobes 8 to 10, rotate, white, fusiform, 8 mm. long and 2 mm. central diam.; seeds light brown, smooth, obovate, 4 mm. long, 3 mm. broad near apex, and 1.5 mm. thick; hilum minute, sub-basal; a whitish keel on dorsal rim near base; plants flower May-June and have none but fibrous roots.

H-19) A member of Echinomastanae that is sparingly scattered, never numerous, over thousands of square miles of the lower "Big Bend" region. As it flourishes in many far flung, apparently isolated colonies, one isn't surprised to find that it is a variable species that has often been confused with *Echinomastus intertextus* which grows at elevations of 1000 to 1500 feet greater and a little farther north. The roots of H-19 are few and fibrous. They often grow in crevices of barren rocks or along the rocky breaks at the margins of little mesas, or on clay slopes that are mantled with shaly detritus. Description: plants solitary, dark green, usually globose, rarely short oblong, to 8 cm. in diam.; ribs 13, spiralled, wrinkled into obvious tubercles, these grooved on upper side from areole to axil, grooves white woolly in youth, glabrate in age; radial spines 11 to 16, usually about 14, up to 24 on plants from one isolated locality, wide spreading, bristly, as they are set at an angle of 10 degrees or more to the plane of the areole, terete, stiff, pale brown to dull purplish, sometimes with from 1 to 3 weaker white spines in upper end of slot, main radials 1 to 2 cm. long; central spines from 1 to 4 in various isolated colonies, in 4 widely separated regions just 1 central spine, that 14 to 18 mm. long, stiff, same size and color as largest radials, always ascending, connivent over crest, in many other localities there are 4 central spines, the upper 3 spreading, erect or ascending, connivent, 1.5 to 2 cm. long, size and color of radials, the 4th or lower central slightly deflexed, rarely porrect, pale brown to purplish, 1.5 to 2 cm. long; flowers not seen except in one locality in 1934, those pure white; fruit globose, clustered inside the small circle of youngest tubercles in white woolly crest of plants, to 1 cm. in diam., thin walled, usually olive green, sometimes pinkish near persistent perianth, with a few white, thin margined, often cordate scales with glabrate axils; seed large, black, papillate, 2 mm. long; hilum sub-basal, depressed, rimmed, oblong, curved, 1 mm. long, interior smooth; seeds keeled dorsally half way up from base. These plants grow at elevations of from 3000 to 3800 ft., but the elevational range in any one locality is but 2 or 3 hundred ft. The fruit matures early and becomes detached at base which leaves a large pore through which the seeds escape or are carried away by ants; most of them were gone by May 15th.

H-20) Another member of Echinomastanae and it resembles H-19 but has 21 instead of 13 ribs and is usually oblong in shape. I found just one specimen of this 21 ribbed species when I was scouring the region where I first found H-19. As the solitary specimen was 15 cm. high and 10 cm. in diam., with 21 ribs instead of 13, it's easy to imagine my perplexity then and my delight the next day when I discovered many robust specimens of H-20 growing along a ridge many miles away and fully 1000 ft. above the habitat of H-19. On another trip I found H-20 in another locality about 20 miles from the first place, but it may be scattered over the intervening territory. H-19 and H-20 are treated here as two new species, but one may be a sub-species of the other. The flowers and further study will solve this puzzle. Description of H-20: Plants simple unless injured, which may produce several knob-like stems, short-oblong or globose, to 15 cm. high and 10 cm. in diam.; ribs 21, spiralled, 5 to 6 mm. high including tubercles, which are slotted from areole to axil on upper side, slots white woolly to floccose in youth, glabrate in age; areole circular, white woolly at first, later naked; radial spines 10 to 16, usually 12 to 14, all stout, stiff, straight, spreading, gray to pale yellow below, brown above, 1 to 2 cm. long, the circle of radials forming a shallow, inverted cone, as the spines are set at an angle of 10 degrees or more to the plane of the areole; central spines, one, ascenting, connivent over crest, never porrect, straight, stiff, base gray or pale yellow, light to dark brown above, 1.6 to 2 cm. long; flowers not seen, but always in floccose depression in crest, within a circle made by the youngest tubercles; fruit small, globose, 6 to 7 mm. in diam., thin walled, olive green, sometimes pinkish near the persistent perianth, smooth except for a few thin, whitish scales that are naked in their axils; seeds black, minutely tubercular, 2 mm. long, 1 mm. thick; hilum sub-basal, curved, oblong, depressed, 1 mm. long, with a microscopic, irregular ridge from end to end. Seeds escape from basal port of fruit, which ripens early and detaches from its woolly nest. The roots of this species are fibrous, from a short, conic, woody taproot.

H-5) Another really distinct species of *Echinomastus,* was found only in two widely separated regions and always on limestone mesas and ridges. It is not plentiful and can be classed as a rare cactus. These plants, with their ribs completely hidden by the interlocking, white, acicular spines, resemble an *Escobaria* more than they do most members of Echinomastanae, but the seeds, early date of flowering, together with

other generic characteristics, prove that it is a member of the latter genus. Tentative description of H-5: Plants simple, globose to short oblong, sometimes obovate or even obconic, fibrous roots from short, conic, woody taproot, to 9 cm. high and 6 cm. in diam.; ribs 21, completely hidden by the interlocking spines, wrinkled into indistinct tubercles that are slotted all way from areole to axil on upperside, slots woolly at base only in youth; areoles nearly circular, a little longer than wide, about 3 mm. long, clothed with short, gray to light brown, persistent wool; radial spines 25 to 35, usually about 30, rather stiff, straight, acicular, spreading, grayish white, often minutely tipped with palest brown, shortest radials 4 mm. long, at bottom of areole, longest radials are laterals, to 1 cm. long; central spines, usually 4, rarely 6 on a few areoles, the lower one of these porrect or slightly curved downward, stiff, 5 to 12 mm. long, gray below, palest brown above, the other centrals divergent, erect, connivent over crest, stiff, usually slightly recurved upward, to 2 cm. long, usually less; no flowers seen, but in a compact cluster in floccose depression 1 cm. in diam. within circle of youngest tubercles at crest of plants; fruit green, thin walled, not dry at first, 10 mm. long, and 6 or 7 mm. in diam., splits horizontally near center, permitting early escape of seeds; several thin, whitish, ovate to cordate scales with naked axils near top of fruit; seeds black, minutely tubercular, obliquely obovate, 2 mm. long and 1.5 mm. wide near apex; hilum sub-basal, curved, depressed, circular, with a microscopic longitudinal ridge, rim of hilum stout, smooth, shining, black; seeds keeled dorsally half way up from base; perianths are persistent. These plants flourish at an elevation of 3400 to 4000 ft. Young plants have just 1 central spine, erect, appressed, recurved over crest. The membranous surface is a pale grayish green.

H-4) A small *Escobaria* found only in one small area, growing with its *more or less fleshy taproot* in the crevices of upper Edwards limestone, never in the overlying Georgetown limestone which forms a part of the same slope, which has an elevation of about 3400 ft where H-4 grows. When this little cactus was first seen I thought it might be a sub-species of a similar cactus, *C. hesteri,* but a direct comparison later proved it to be a distinct species of *Escobaria.* Description: Plants simple, globose, to 4 cm. in diam., usually much smaller, the smallest plant seen with mature fruit was but 12 mm. in diam.; tubercles small, short, slotted on upper side from areole to axil, base of slots woolly only in young tubercles; radial spines 24 to 36, acicular, spreading, white, barely tipped with brown, from 5 to 10 mm. long; central spines 3 to 8, rarely 16, sometimes with bulbous base, spreading or appressed, to 1.2 cm. long, white below, brown above; flowers not seen but to 10 or 12 in crest of plants from young, often immature tubercles; fruit matures by May 1st., then green, thin walled, from 5 to 10 mm. long, and 2.5 to 5 mm. in diam.; year old fruit scarlet, clavate, extrusive, to 2 cm. long and 5 mm. in diam.; fruit from previous season often persisting until July; seeds dull black, globose, punctate, 1 mm. in diam.; hilum white, oblong, depressed, in truncate, narrow base. Note: The seeds resemble those of some species of *Mammillaria* more than they do those of any member of *Escobaria* known to me. Later I found a solitary specimen of H-4 on top of a limestone mountain at least 50 miles from the type locality—and it had about 36 radial and 16 central spines. So this little cactus may have a much larger range than was first suspected.

In 1930, 1934, and again in 1937, I saw and studied 2 strange, widely separated species of Echinocereae that are apparently related but distinct species and new. Both share the odd habit of clothing their young in white silky filaments, instead of spines, until they are 2 or more years old. These species will be described as H-1 and H-41. Both flourish almost exclusively in quartzite rocks and have somewhat similar flowers but the spines are radically different.

H-1) Plants usually simple, sometimes with 2 or 3 stems, oblong, to 12.5 cm. high and 7.5 cm. in diam., with fibrous roots; ribs low, usually straight, more or less tubercled, 13 to 18; areoles oblong, 2x3 mm. in diam., short white woolly in youth, glabrate in age; radial bristles about 40, weak, white, the shortest 3 mm. long, at top and bottom of areole, the laterals are to 8 mm. long; all radials are white in youth, gray later, darker on lower part of old plants; central spines, 7 to 14, longer and stronger than radials but still weak, bristle-like, white below, at first with reddish tips, later gray, often angular, all divergent, to 2 cm. long; flowers (May 5th too late in season to see many) small, greenish yellow, sometimes, yellowish brown, from upper edge of areoles one-third to one-half way down side of plants, campanulate, about 2 cm. long and broad; outer perianth-segments about 7, more or less imbricated, of various lengths and widths, greenish with acute, scarlet tips; inner perianth-segments 20 to 30, oblong to oblanceolate, obtuse to apiculate, sometimes more or less fimbriate, olive green, about 1.3 cm. long and 4-5 mm. broad; filaments pale green, attach to wall of cup; anthers white, flattish, attached at end; style pale greenish white, exserted beyond anthers; stigma lobes 6 to 10, pale green, linear, obtuse; ovary globose, about 1.5 to 2 cm. in diam., green, covered with minute, fleshy, acute leaves in axils of which is a little white wool and a cloud of long, fine, white bristles; fruit greenish, globose to short oblong; seeds dull black, roughened with minute tubercles, truncate at base, 1 mm. in diam.; hilum oblong, white, depressed below a smooth narrow rim. Note: These cacti found only in one small, isolated region, usually growing along quartzite ridges or S. slopes at an elevation of about 4000 feet.

H-41) Grows in white quartzite about 12 miles south of Marathon and has been widely distributed by a dealer, presumably as *Echinocereus chloranthus* which it resembles in some particulars but H-41 clothes its youngsters in white silken filaments while *E. chloranthus* sticks to spines from cotyledons to the end. That profound difference must mean more than a subspecies so I'm tentatively giving H-41 a specific status. Description: Plants solitary unless injured or diseased, then 2 or more stems, oblong, to 20 cm. high or possibly more, and 7-8 cm. in diam., dark green; ribs prominent and tubercled, rather broad, 13 to 18, 8 mm. high; tubercles 4 mm. high, flattened laterally; areoles oblong, short white woolly in youth, nearly glabrate in age; radial spines about 30, more or less pectinate, from 4 to 8 mm. long, the shortest and weakest in a fascicle at upper edge of areole, stiff, white, translucent water gray, and dull yellow, often in alternate bands giving a minor rainbow effect; central spines 5 to 9, usually reddish or brown with swollen bases, these often gray or white, divergently radiating, usually none porrect, about same length as radials but much stouter; flowers 2.5 cm. or more below crest of plants, from upper edge of areoles, campanulate, 2 cm. long, never open wide, appear in April, May, and June; outer perianth-segments about 12, various lengths, rather fleshy at base, brown to carmine, longer ones obtuse, shorter ones lanceolate, acute; inner perianth-segments about 24, linear-obovate, usually obtuse, entire, outer midrib dark crimson

lake, inner midrib medium raw sienna to brown pink, margins lighter; filaments attached to walls of cup, greenish white, included; anthers palest yellow-white, 1 mm. long; style 1.5 cm. long, 1.5 mm. in diam., sap green, exserted 4 mm. beyond filaments; stigma lobes about 10, sap green, taper gently to obtuse end, 2.5 mm. long; cup 1 cm. in diam. and 8 mm. deep; ovary globose 5 mm. in diam. covered with dark green, fleshy leaves with acute, scarlet tips in axils of which is a mass of white wool and many white bristles—no spines; fruit globose, 1 cm. in diam., purplish green; seeds dull black, roughly tuberculate, 1 mm. long, basally truncate; hilum white, basal, nearly circular, depressed below narrow, black, smooth, shining rim; plants have fibrous roots.

H-10) In April, 1934, I discovered in southwest New Mexico an Escobaria that appears to be a new species and like most members of that clan, it is found only in limestone. Description: Plants simple—or cespitose, usually with several stems from one taproot above ground line, to 10 cm. high and 5 cm. in diam., short oblong, taproot conic with fibrous feeders, strongly tubercled, these to 12 mm. long, grooved on upper side from two-thirds to three-fourths of way from areole to axil, grooves white wooly even after flowers and fruit have gone; areolae oblong, 3 mm. long; radial spines, white, weak, bristle-like, to 6 mm. long, 30 to 40; central spines acicular, weak, longer and stronger than radials, to 1 cm. long, white with reddish brown tips, 18 to 22; flowers numerous, in crest of plants from youngest tubercles, mildly campanulate, 2 cm. long and 10 to 12 mm. wide at tip; outer perianth-segments about 18, long-ciliate, linear-acuminate, midribs pink to brown pink, margins lighter; inner perianth-segments 18 to 24, in 2 rows, linear to narrowly oblanceolate, acute, 1 to 2 mm. wide, midribs bright pink, entire margins pale pink; filaments about 6 mm. long, attached to walls of cup all way down, greenish at base, bright pink above; anthers dull yellow; style pink above and white below, exserted 2 mm. beyond anthers; stigma lobes about 5, fluted, icy white, in compact ball 1 mm. in diam. first day but diverge slightly third day to 1.5 mm. in diam.; ovary sap green, naked, sits in white wool, 7 mm. long and 4 mm. in diam.; fruit whitish above, greenish below, oblong, 1.2 to 1.4 cm. long and 4 to 5 mm. in diam., thin walled, a bit juicy at first, extrusive; seeds obliquely obovate, light brown, minutely dented, not pitted, 1.2 mm. long; hilum white, sub-ventral; flowers open 3 p. m. or later and close after sundown for 2 or 3 successive days; first fruit ripens in August. The perianths are persistent.

H-51) There is another Escobaria in south central New Mexico that may be a distinct species or merely a sub-species. It was found in June, 1937, so no flowers were seen. These plants are usually found in limestone and will be described as H-51: plants usually cespitose, sometimes solitary, then to 10 cm. tall and 5 cm. in diam., always branched above ground line, short oblong, tubercled, the tubercles slotted from areole to axil on upper side; groove white woolly below, sometimes with from *1 to 4 white bristles in groove just above white wool;* radial spines white, bristle-like, 35 to 40, from 6 to 8 mm. long; central spines larger than radials, divergent, white with minute brown tips, 10 to 12, 7 to 12 mm. long; flowers not seen but cover crest of plants; fruit olive green, sometimes pinkish above, ripen in August and later, then slightly extrusive, to 14 mm. long and 5 mm. in diam., thin walled with from 1 to 3 micro-scales above in axils of which are long white cilia; seeds dark brown, finely dented, obliquely obovate, 1.1 to 1.2 mm. long and 1 mm. wide; hilum minute, white, oblong, sub-ventral.

ARIZONA'S UNKNOWN ECHINOCEREUS

AXE) In 1934 I found in S. E. Arizona an Echinocereus that may be a Nov. Sp. or at least a subspecies of *Echinocereus rigidissimus,* which does not grow in the region occupied by AXE.

The new cactus has spines of just one color—reddish above, grayish below. AXE—tentative description—Plants simple, oblong to slim cylindric, to 2 dm. high and 7 cm. in diam.; taproot woody, obconic, with fibrous feeder roots; ribs 13 to 18, usually straight, strongly tubercled; areoles oblong, 3 mm.x 1.5 mm. in diam., persistently white-woolly; radial spines 13 to 17, commonly 15-16, pectinate, rigid, grayish below and reddish above, or reddish all way, 2 to 8 mm. long, shortest ones at top of areole, the longest around lower half of areole; central spines 1 to 7, usually 4 or 5, rather stubby, rigid, 1 to 4 mm. long, reddish to brown above, paler below, the bottom one longest, slightly deflexed, all irregularly divergent; flowers from upper edge of areole, just below apex of plants, a delicate pinkish purple, campanulate, about 7 cm. broad and 5 cm. long; outer perianth segments 14 to 16, of various lengths, midrib brown pink to burnt sienna, margins pink, acute to obovate; inner-perianth segments in 2 rows, obovate, apiculate, 4 cm. long and 1 cm. wide 10 mm. below tip and 2 mm. wide at bottom, tips more or less fimbriate, midrib pinkish purple, margins paler to white, base for 12 mm. greenish yellow; filaments greenish yellow, attached to walls of cup all way down, about 12 mm. long, cling to style at first, later widely divergent; anthers chrome yellow, 1 mm. long, linear; style stout, included, 3 mm. in diam. about 2 mm. below top of filaments; stigma-lobes about 12, bright green, linear, obtuse, 7 mm. long; fleshy cup 1.5 cm. in diam. and 1 cm. or less deep; top of ovary has a few fleshy leaves, acute, burnt sienna, in axils of which is white wool and white, acicular spines with brown tips, rest of ovary with approximate white woolly areoles with acicular spines, white below with brown tips; apex of plants very woolly; flowers never more than 5 cm. below crest, usually less, open about 10 a. m. and close 5 p. m.; fruit unknown; seeds dull black, roughly tuberculate, basally truncate, 1.3 mm. long, 1.1 mm. wide, a bit obliquely obovate, hilum basal, depressed, white, slightly oblong, rim smooth, keeled dorsally opposite hilum.

E. rigidissimus for comparison is described: Spines all radial, pectinate, *18 to 26, usually about 20,* from 2 to 12 mm. long, the longest spines are laterals on lower half of areoles, usually 2 or 3 spines at bottom of areoles that are 2 or 3 mm. shorter than laterals, the shortest radials are at top of areoles, where there is a *fascicle of 5 to 8* weak, white spines. The areoles of *E. rigidissimus*—4 mm. narrowly oblong—with white wool only in youth—soon glabrate. Spines arranged in horizontal bands of white, gray, and red—*rarely all reddish.*

Apologia, March, 1939: It is now realized that taking the plants to Tucson was a mistake. Professor Thornber was seriously ill during the spring of 1938 and couldn't take the necessary flower photographs and I did not hear of his illness until too late to take them myself. The plants have been uprooted and moved twice, once into a dust bowl where many of them perished, probably necessitating another trip to Texas for plants and pictures. That is why this preliminary description is so important. J. P. H.

Lemaireocereus montanus

WHAT IS THE LARGEST CACTUS?

Question: What cactus is thought to be the largest in the world? What is its name, height and where is it growing? J. GERDERMANN, Mo.

Answer: Carnegiea gigantea, the sahuaro of Arizona and northern Sonora, Mexico, is usually considered as the largest cactus. Specimens of about 50 feet in height have been reported but this we cannot confirm.

The much branched *Trichocereus terscheckii* of Northern Argentina attains a height of 40 feet and has more branches than a *C. gigantea* and must greatly exceed *C. gigantea* in bulk and weight. It is probably the world's largest.

The accompanying photograph of *Lemaireocereus montanus* in the Sierra Madre mountains of Southern Sonora, Mexico, is about 35 feet tall with over 30 heavy branches and is the largest cactus plant I have seen in extensive travels through the cactus districts of the United States, Mexico, and the West Indies.

Stetsonia coryne and *Cephalocereus macrocephalus,* while not the largest, are surely very large plants. Mr. Hertrich's booklet *A Guide to the Desert Plant Collection* shows a *Cereus xanthocarpus* weighing over five tons.

WM. TAYLOR MARSHALL.